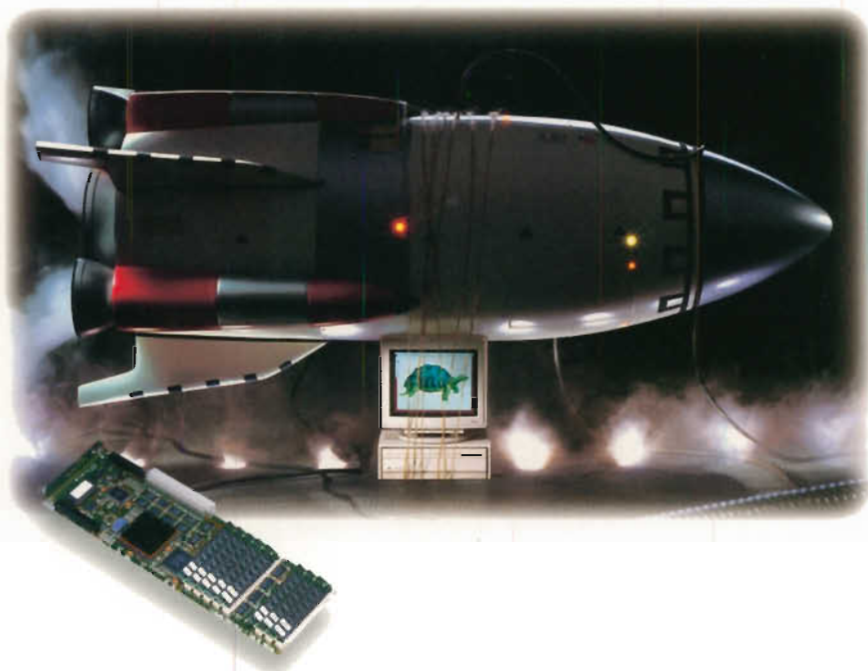


radius

# ROCKET™ USER'S MANUAL





***Radius Rocket***  
***User's Manual***

March 1993

Radius Inc  
San Jose, California



***Printed in the United States on recycled paper***

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## ***Introduction***

Congratulations on your purchase of the Radius Rocket™ accelerator card for the Macintosh II family of computers. When installed in a NuBus slot of a Macintosh II computer, the Radius Rocket will significantly improve the overall performance of the Macintosh.

The Radius Rocket offers the following features:

- A state-of-the-art Motorola 68040 processor operating at 33 MHz or a 68LC040 processor operating at 25 MHz.
- NuBus™ installation, which allows accelerated NuBus communication with interface cards, such as high-speed SCSI and display interface cards that support block transfer.
- Built-in QuickDraw™ acceleration, which supports high-performance NuBus block transfer when used with Radius display interfaces.
- Built-in Radius QuickCAD™ acceleration, which supports QuickCAD-compatible software.
- Compatibility with parity Random Access Memory.
- Compatibility with virtually all Macintosh NuBus cards, for complete accessory card support regardless of manufacturer.
- Compatibility with Apple System 7.0.1 and later.

Each Rocket is bundled with Extensions Manager software and Connectix™ MODE32 software, which allows Macintosh II, IIx, and IIcx computers to address up to 128 MB of memory with System 7 software.

### **Registration Card**

You will find a Warranty Registration card in your Rocket kit. Please fill out the card and return it to Radius so we can provide you with the best customer support possible.

### **About This Manual**

This user's manual is divided into five chapters and includes a table of contents and an index.

**Chapter 1** .....*Installing Your Radius Rocket* explains how to install the Radius Rocket accelerator card.

**Chapter 2** .....*Installing RocketWare* explains how to install the software required to operate the Radius Rocket.

**Chapter 3** .....*Using the Radius Rocket* explains how to work with the software that controls the operation of the Radius Rocket.

**Chapter 4** .....*About the Radius Rocket* explains how the Rocket accelerates the performance of the Macintosh II.

**Chapter 5** .....*Reference* contains a troubleshooting section, technical specifications, as well as customer service information.

*Rocket*, used hereafter in this manual, refers collectively to two models of the Rocket accelerator card, namely:

- The Rocket 33, a Motorola 68040 operating at 33 MHz
- The Rocket 25i, a Motorola 68LC040 operating at 25 MHz



## Chapter 1

# Installing Your Radius Rocket

This chapter explains how to unpack and install the Radius Rocket accelerator card in the Macintosh II, IIx, IIcx, IIci and IIfx computers. For simplicity, this chapter will refer to this family of computers simply as the *Macintosh II*.

Once you have installed the Radius Rocket accelerator card in a Macintosh II, you will need to install the RocketWare files on your startup disk. Information about software installation appears in Chapter 2: *Installing RocketWare*.

### Unpacking

When you first open your Rocket accelerator kit, make sure that you have everything to set up your accelerated Rocket. Unpack all the components and match them against the inventory of the packing list.

If you are missing any items, contact your Radius Authorized Reseller.

*System requirements include:*

- An Apple Macintosh II, IIx, IIcx, IIci or IIfx
- Apple System 7.0.1 or later
- A hard disk drive
- A minimum of 4MB of system RAM on the main logic board of the Macintosh
- A minimum of 8MB of RAM to provide system memory for the Radius Rocket accelerator card. However, if you plan to work with multiple applications, Radius recommends at least 16MB of RAM for the Rocket accelerator card.



Radius recommends saving your Rocket box and its packing materials. Use only the original packaging for shipment or relocation of your equipment. Substitute packaging may not provide adequate handling protection. However, if you do not anticipate re-shipping your Rocket, we suggest that you take your packaging to a recycling center.

### **Memory Configurations**

The Radius Rocket accelerator card uses system memory that is installed on the card itself, rather than on the main logic board of the Macintosh II. *No such memory is provided with the Rocket kit; it must be installed separately before the card is used.*



**Important:** A minimum of 8MB of RAM of single in-line memory modules (SIMM)s with a speed not slower than 100 nanoseconds must be installed on Rocket. For the Rocket 33, 80 nanoseconds or faster is recommended.



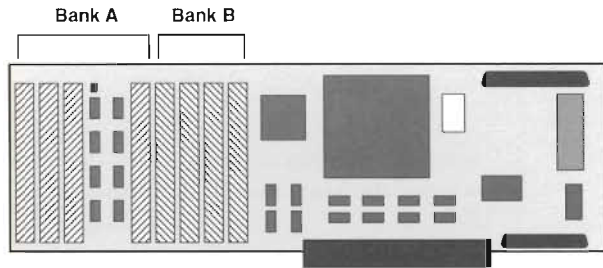
Before you buy new SIMM cards for the Radius Rocket accelerator card, note that you can use compatible SIMM cards from the main logic board of your Macintosh on the Rocket. If you remove SIMM cards from your Macintosh, leave at least 4MB of RAM on the main logic board. Note that you cannot use SIMM cards from a Macintosh IIfx on a Rocket; these cards are physically incompatible with the Rocket accelerator card.



**Important:** Should you decide to remove SIMM cards from your Macintosh while it is still under an Apple warranty, it is important to have the work done by an authorized Apple Service Provider. If you remove SIMM cards from your Macintosh, the Apple warranty for your Macintosh will be void.

SIMM cards are available in a variety of configurations that are compatible with the Radius Rocket accelerator card.

SIMM cards are installed in two banks of four cards each (Bank A & B), as illustrated by the following diagram. A bank is a set of SIMM sockets that are logically linked, and therefore, must all be filled with the same size and speed SIMM or be empty.



*When adding RAM SIMMs to your Rocket, keep in mind,*

- Each SIMM bank must be completely full or empty
- Each SIMM bank must be filled with SIMMs of the same size and speed
- If you only fill one bank with SIMMs, use bank A.



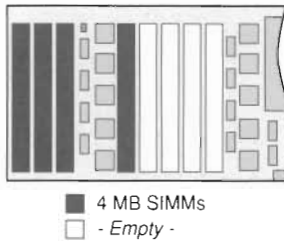
**Important:** *SIMM cards must be installed in multiples of four. In other words, you may install either four or eight SIMM cards on the Radius Rocket accelerator card.*

The following diagrams show some of the configurations of SIMM cards that can be used with the Radius Rocket, and the total system memory available for each configuration.

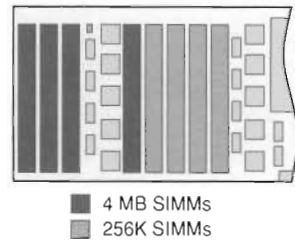
### 8 Megabytes



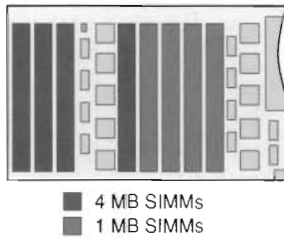
### 16 Megabytes



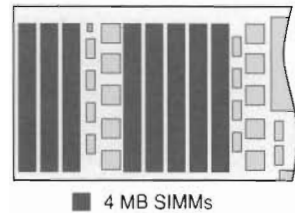
### 17 Megabytes



### 20 Megabytes



### 32 Megabytes



*Possible SIMM card configurations*



**Important:** If you will be installing 256K SIMM cards in the Rocket, they **must** be of the latest configuration; they must have two memory chips on the SIMM card rather than eight, as shown in the following diagram.

**256k SIMM with eight RAM chips:  
cannot be used with Rocket**



**256k SIMM with two RAM chips:  
compatible with Rocket**



*256K SIMM compatibility*



**Important:** The Radius Rocket accelerator card uses interleaved-memory management. Due to this architecture, the greatest performance will be realized when both banks (all eight) of the SIMM sockets are filled with SIMM cards of the same memory size. While 2MB and 8MB SIMMs will work on your Rocket, your computer cannot perform interleaving with these SIMM cards.

SIMM cards are available with even greater memory capacities. The Radius Rocket accelerator card is compatible with some 16MB composite SIMMs (sixteen megabytes per card), for a total Rocket memory of 128 megabytes. Check with the manufacturer for compatibility with the Rocket.

Of course, the SIMM cards that are installed on the Radius Rocket accelerator card must fit within the housing of the Macintosh II. Therefore, you should only use SIMM cards that are no larger (once installed) than the height of the Radius Rocket accelerator card.

### Memory Speed

In addition to determining memory configuration, the Radius Rocket accelerator card is sensitive to the *speed* of the SIMM cards that are used. A special jumper is provided on the Radius Rocket accelerator card so that the card can be set to accommodate the speed of the SIMM cards.

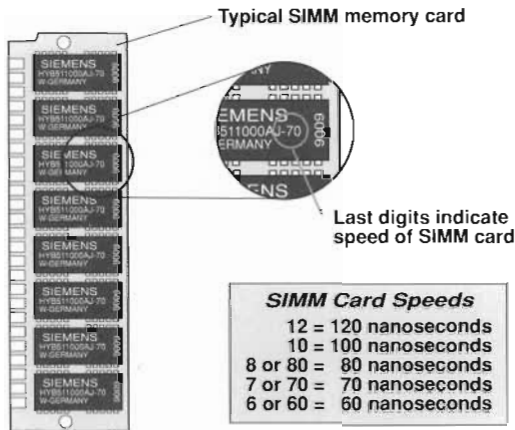
The speed of SIMM cards is rated in nanoseconds — the amount of time that it takes to write or read **memory** from the individual chips on the card. The higher the nanosecond rating, the slower the performance of the SIMM card.



**Important:** *SIMM cards that are slower than 100 nanoseconds (i.e., 120 nanoseconds) are not compatible with Rocket 33. Rocket 25i can use 120ns SIMMs. However, jumper J2 must then be removed. The table below lists the acceptable and recommended SIMM speeds and presence of J2 for the various Rocket cards.*

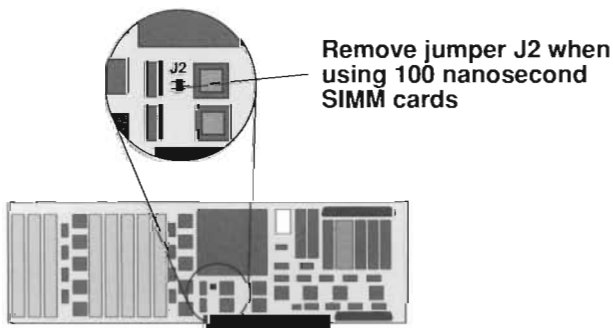
| Acceptable |       | Recommended |           |
|------------|-------|-------------|-----------|
|            |       | J2          | J2        |
| Rocket 25i | 120ns | off         | ≤100ns on |
| Rocket 33  | 100ns | off         | ≤80ns on  |

The speed of the SIMM card is printed on the top of the individual chips mounted on the card. The speed corresponds to the number following the dash mark (“—”) on the chip, as illustrated by the following diagram.



**Important:** On the Rocket 33, if **any** of the SIMM cards to be used are rated at 100 nanoseconds, jumper J2 must be removed. J2 is clearly marked on the actual board. For example, if the SIMM cards in bank A are 80 nanosecond speed, and the SIMM cards in bank B are 100 nanosecond speed, the jumper J2 **must be removed** (as described in the following section). It is safe to leave the plastic jumper block hanging from one of the J2 pins for storage.

The jumper J2 is a small plastic block fitted over a pair of pins that protrude from the Rocket's circuit board. Do not confuse J2 with jumpers J5 or J6. The following illustration shows the location of jumper J2.



Rocket card, showing the location of jumper J2



**Important:** *Do not mix SIMMs of different speeds in the same bank of your Rocket.*

### **Installing SIMMs on Your Rocket**

Once you have decided on a memory configuration and the jumper J2 position to be used with the Radius Rocket accelerator card, you can install the SIMM cards.

*To install the SIMMs,*

1. Begin by clearing a work space in front of your Macintosh computer. Turn off the power for the Macintosh II and any attached peripherals (modems, hard disk drives, etc.). Leave the computer plugged into a grounded power outlet, however, so that the power cord can serve as a ground for the system.



**Warning:** *Leaving the computer turned on could result in electrical shock to you and/or cause damage to your computer system's components.*

2. Remove the lid from the computer's main unit. Use a Phillips-head screwdriver to remove the security screw at the top center of the rear panel.

**Security screw**



**Lid latches**

*Removing the lid from a Macintosh II*

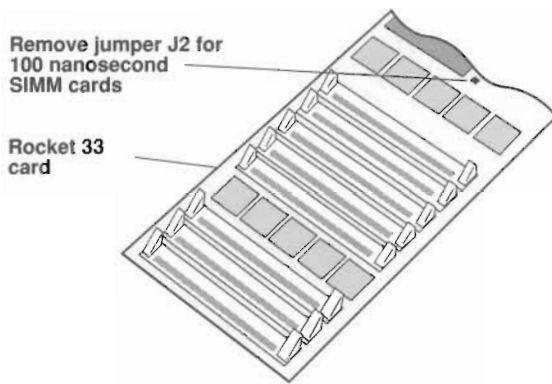


From the front of the Macintosh II, place your hands around the rear corners of the case and press on the latches as you lift up on the back of the lid. (If you have a Macintosh IIfx or IIfx, pull up on the latches.) When the lid releases, lift the lid all the way off the case and set it aside.

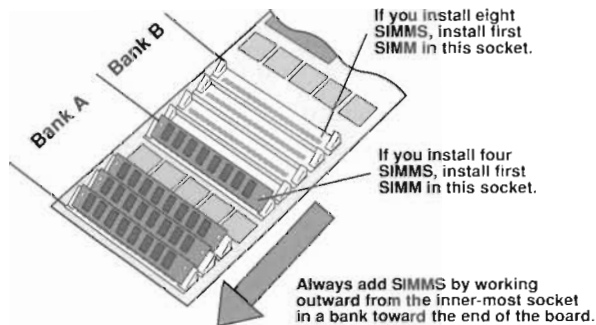
3. Touch one of your hands to a bare metal surface on the power supply; this will discharge any static electricity from your body. While performing any installation step that involves touching the Rocket interface card, or SIMMs, or parts of the motherboard, one hand should be touching the power supply to provide grounding.

If you are not able to perform some of the steps using a single hand, use both hands, returning one hand occasionally to the bare metal surface of the power supply when it is no longer needed for an installation step.

4. Remove the Radius Rocket accelerator card from its protective anti-static bag, and place it on top of the bag with the component side (the side with the chips) facing upward.
5. If any of the SIMMs to be used with the Radius Rocket 33 accelerator card are rated at 100 nanoseconds (as described in the preceding section of this chapter), remove the jumper J2. To remove the jumper, pull it straight off of the pins. Save the jumper for possible future use by leaving it on *one* of the pins.



6. Determine which SIMM socket will be used for the first SIMM card to be installed. If you intend to install a total of eight SIMMs on your Rocket, the first SIMM socket should be in Bank B, in the socket closest to the center of the Rocket card. If you will install a total of four SIMMs on Rocket, the first SIMM socket will be in Bank A of the SIMM sockets, as shown in the diagram below.

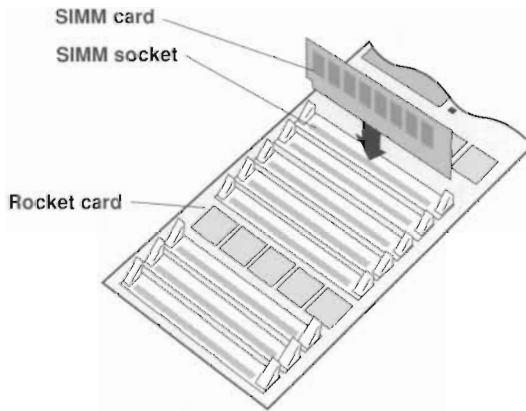


The remaining diagrams and procedures show the installation of eight SIMMs in banks A and B.

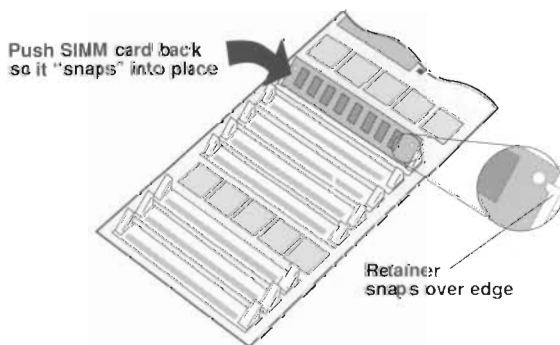


**Warning:** Touch the power supply chassis to discharge yourself.

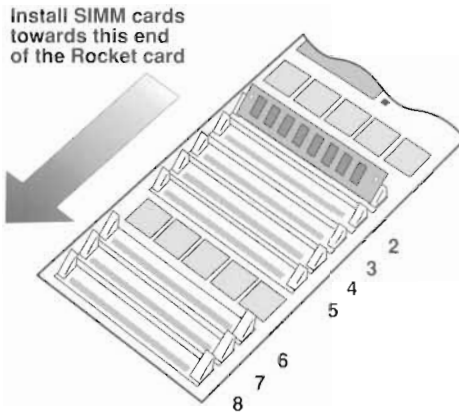
7. Remove the SIMMs from their protective anti-static wrappers. Grasp a SIMM so that its electrical connectors are pointed downward and push it straight down and firmly into the first SIMM socket, as shown in the following diagram.



8. When the SIMM is seated in its socket, push the metal tabs of the connector apart, then push the top edge of the SIMM *back* so that it *snaps* into place. When properly installed, the metal end retainers of the socket will snap over the edges of the SIMM, as shown in the following diagram.



9. Continue installing the SIMMs in the remaining SIMM sockets. For ease of physical access, work out toward the end of the Radius Rocket accelerator card, as shown in the following diagram.



When you have installed all of the SIMMs on the Radius Rocket card, check to make sure that each SIMM is seated securely in its socket, and that the metal retainers are snapped over the edges of each SIMM card.

At this point, the Radius Rocket accelerator card is ready to be installed in the Macintosh.

## Installing Your Rocket in Your Macintosh

The Radius Rocket accelerator card installs the same way as other NuBus expansion cards — in the main unit of the Macintosh II.



Before you actually install the Radius Rocket accelerator card, make sure that you have installed the SIMMs and, if needed, adjusted jumper J2 as described in the previous section.

Even if you are familiar with installing NuBus cards in the Macintosh II, you should review the following section before you begin installation.



**Important:** *Because there are limits to the amount of electrical power available for the expansion slots in a Macintosh II, you may need to assess power requirements if you are using several expansion cards. (The exact power consumption specifications are listed in Appendix A of this manual). Under most circumstances, there should not be any problem. If you plan to use several cards, refer to your Macintosh owner's guide for specific NuBus power capabilities.*

Ensure that your Macintosh is turned off.

*To install the Radius Rocket accelerator card,*

1. Choose the NuBus expansion slot to be used for the Rocket card. The expansion slots are the narrow plastic strips running along the bottom of the main unit. It does not matter which slot is used; your choice of slots will depend on what other slots are in use.
2. Remove the expansion cover shield for the NuBus slot. This metal shield is aligned with the slot and is clipped into the inside back wall of the Macintosh. Lift the shield straight up until it is clear of the locating pin (at the top) and guide clip (at the bottom). Note that expansion cover shields are not used on the Macintosh IIcx or IIci.



3. Push out the plastic panel cover that lines up with the slot.

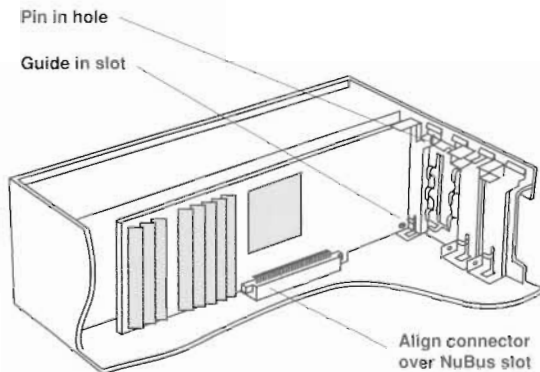
**Warning:** *Metal edges on the expansion slot may be very sharp. Be careful.*

4. Touch the bare metal of the power supply in your Macintosh. Position the Rocket card over the NuBus expansion slot. Note that the end of the Rocket card has a metal shield, similar to the shield removed in the previous step. For the Macintosh II, IIx, and IIfx align the card to ensure that the locating pin (at the top) and the clip (at the bottom) will fit into the shield on the interface card.

For the Macintosh IIcx and IIci, make sure that the metal shield on the Rocket card is aligned with the tab on the inside of the back panel.

While aligning the Rocket card, be careful not to touch the pins on the bottom of the NuBus connector.

5. Next, align the NuBus connector on the Rocket card with the pins of the NuBus slot on the Macintosh II. Push down firmly until the card is seated. Do not force the card; if you meet a lot of resistance, pull the card out and try again.



*Rocket card installed in the Macintosh II*

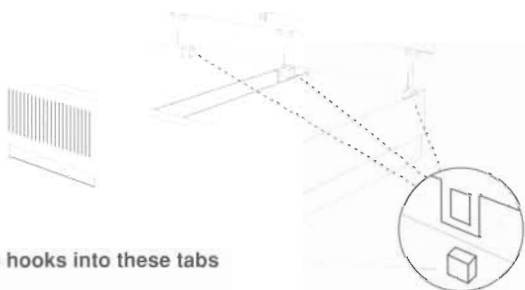


**Warning:** Once the Rocket card has been installed, do not wiggle the card from side to side. This may damage the card and/or the slot.



**Important:** If there is another accelerator product connected to the main logic board of your Macintosh II, it should be removed at this time.

6. Test to see if the Rocket card is properly installed by lifting the card gently. If it resists and stays in place, the interface card is properly connected.
7. Replace the lid on the top of the Macintosh II. Be careful to slip the hooks on the underside of the lid into the tabs along the inside front of the Macintosh II, as shown in the following diagram.



Slip hooks into these tabs

*Replacing the lid on a Macintosh II*

Hardware installation is now complete, and the Rocket-enhanced Macintosh is ready for software installation, as described in the following chapter. If you need further information on installing NuBus expansion cards, refer to your Macintosh owner's guide.





## Chapter 2

### Installing RocketWare

The Radius Rocket accelerator card is activated and controlled by two software files: the RocketWare Control Panel and Rocket Cargo Extension. Both of these files must be installed in the System folder of your startup drive to activate the Radius Rocket. The Rocket Launcher file and RocketWare Preferences file are also required.

In addition, special files are provided to activate Rocket's built-in QuickCAD and QuickColor acceleration.

All of these files reside on the three RocketWare diskettes, which are included with your Rocket kit.



**Important:** *The Rocket requires System 7.0.1 or later and the selection of "System software for any Macintosh" from the Custom installation. If you plan on using file sharing, hold the Shift key down to select file-sharing and network software.*

To install RocketWare on your startup drive,

1. Turn on your Macintosh.



**Important:** *Virus-checking software may prevent the installation of RocketWare or be triggered frequently by the actions of the installer. Temporarily disabling or removing such protection will avoid this inconvenience. It is necessary, in addition, to quit any applications that may be running or automatically launched at start up.*

2. Disable or remove any virus-checking software.



ReadMe



Rocket Lift-Off



Installer

3. After ensuring that your RocketWare diskette is locked (write-protected), insert the first *Radius Rocket* diskette (with the Installer on it) into your disk drive.

In a moment, the diskette window will appear in the Finder, along with the icon for your startup drive.

4. Double-click on the file named *ReadMe Before Install*. This file contains the most current information and supplemental instructions about Rocket and its associated software files. When you have finished reviewing the ReadMe file, choose Quit from the File menu.

One Radius Rocket diskette contains a *Rocket Lift-Off* system checker, which will verify that you are installing your RocketWare on a Macintosh computer that is supported. It will also check for utilities and applications that are not presently supported by Rocket.

5. Double-click on the *Rocket Lift-Off* icon to begin the system check. After it provides an on-screen report, you may save or print the results and then choose Quit from its File menu.
6. Double-click on the Installer. A screen will appear to indicate that the Installer is prepared to install RocketWare files. Click on the OK button to continue.
7. The Easy Install window appears, as shown in the following diagram.



*RocketWare Easy Install window*

Switch Disk

The name of your startup drive should appear in the lower part of the window, under the section entitled "... *on the hard disk named ....*" If the name of your startup disk does not appear in this section, click on the Switch Disk button. Depending on the number of hard drives connected to your system, you may have to click on the Switch Disk button several times.

The Eject Disk, Customize, Help, and Quit buttons are explained when you click on the Help button.



8. Click on the Install button. All of the files necessary to operate your Rocket will automatically be installed in the System folder of your startup drive. When you see a message to insert the second diskette, insert the diskette specified.



9. The Installer application will notify you when all of the RocketWare files have been successfully installed on your startup drive. A message will appear advising you to restart your Macintosh.

**Important:** *If you have removed any previously installed accelerator product connected to your Macintosh's main logic board, you must also remove the software associated with that accelerator product.*

10. Click on Restart within the window. The Macintosh will restart, and the RocketWare files necessary to control Rocket will be loaded automatically.
11. Restore any virus protection you may have disabled.

Software installation is now complete. Unless you want to use the Custom Install feature described below, store your RocketWare diskettes in a safe place in case they are needed for a future installation.

#### Customize

### **Using the Customize Button**

When you have launched the Installer application and the Easy Install window is on the screen, the Customize button is available. This button enables you to define specific RocketWare files that the Installer application will place in the System folder of your startup drive.

Based on your particular Macintosh configuration, you may want to use the Customize button to omit certain RocketWare files from the installation process. To aid you in deciding which files, if any, to remove, the following information is offered.



RocketWare



Rocket Cargo



Rocket Launcher



RocketWare Preferences



RadiusWare

## **Description of Rocket Files**

The following section is a brief description for all of the RocketWare files, and their purpose for controlling Rocket.

- **RocketWare.** This file activates Rocket when the Macintosh is first started. The RocketWare file appears in the Control panel, and contains special settings for using Rocket with a wide variety of Macintosh software. It allows you to turn Rocket on or off, as well as specify a RAM test, and whether or not your Rocket works with Parity RAM. This file is required to activate and work with Rocket.
- **Rocket Cargo.** This file is a companion to the RocketWare Control Panel. It provides a library of service routines for RocketWare. The Installer will place this file in the Extensions folder, inside the System Folder of your startup drive. There are no adjustments or settings associated with this file, and it does not appear in the Control Panels folder.
- **Rocket Launcher.** This file is a System 7 extension that instructs your Macintosh to load the RocketWare Control panel. This file is required to activate and work with Rocket.
- **RocketWare Preferences.** This file is a System 7 preferences file that instructs your Rocket how each application runs on the 68040 chip. This file is required to activate and work with Rocket.
- **RadiusWare.** This file appears in the Control Panel, and has special features for Radius Displays. This file is not required for Rocket operation.



QuickCAD



QuickColor



MODE32



Extensions Manager

- **QuickCAD.** This file is used to activate Rocket's built-in QuickCAD acceleration. It is controlled from within its Control panel. Note that QuickCAD will only accelerate the performance of CAD software (Auto CAD, R10 VersaCAD and Vellum) that is specifically designed to support QuickCAD. If you are not using such software, the QuickCAD file may be omitted from your System folder.
- **QuickColor.** This file enables the Rocket to provide QuickDraw graphics acceleration, in addition to general CPU acceleration, when used in conjunction with a Radius DirectColor or PrecisionColor display interface card. The QuickColor control panel will automatically configure itself to match your display system. Consequently, you should not have to change its settings. This file is not required for monochrome operation, nor for the Rocket to operate properly.
- **MODE32.** This file contains System 7 software for 32-bit addressing on Macintosh II, IIx, and IIcx computers. In 32-bit mode, System 7 can directly access up to 128MB of Rocket RAM.
- **Extensions Manager.** With this software file, you can control system extensions at startup. If you encounter a problem booting your Rocket, use this control panel to disable non-standard extensions.

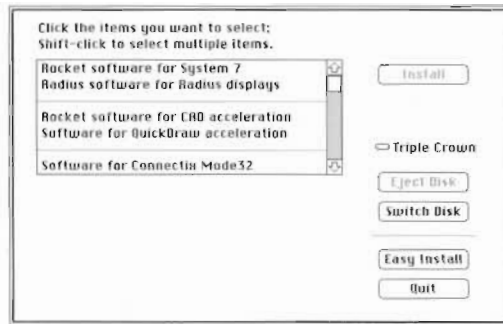
Summarizing the previous descriptions, RadiusWare, QuickCAD and QuickColor files are *not required* for Rocket to operate correctly.



**Important:** You should use the *Customize* button if you want the *QuickCAD*, *QuickColor*, *MODE32*, or *Extensions Manager* files installed in the *System* folder of your startup drive.

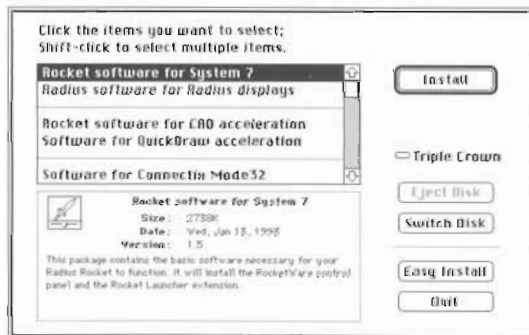
To use the *Customize* button for installing RocketWare files:

1. With the *Installer* application active and the *Easy Install* window on the screen, click on the *Customize* button. The *Customize* window appears, as shown in the following diagram.



*RocketWare Customize window*

2. A scroll box with a list of the RocketWare files appears in the upper-left of the *Customize* window. You can click on any of the RocketWare files for a brief description of that file, as shown in the following diagram.

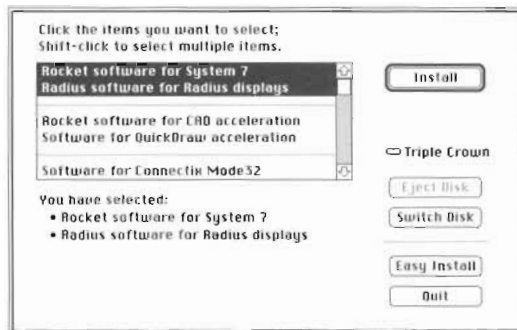


*RocketWare software description window*



## Switch Disk

3. The name of your startup drive should appear in the right center of the Customize window. If the name of your startup disk does not appear in this section, click on the Switch Disk button. Depending on the number of hard drives connected to your system, you may have to click on the Switch Disk button several times.
4. To define the files that will be installed in the System folder of your startup drive, hold down the shift key on the keyboard and click on each of the files. A list of the files you have selected appears in the lower part of the Customize window, as shown in the following diagram.



*RocketWare files selected for installation*

## Install

5. When you have selected all the RocketWare files to be installed, click on the Install button. The Installer will begin installing the RocketWare files. If you receive a message to insert a second diskette, insert the diskette specified. Ensure that the diskette is write-protected.
6. The Installer application will notify you when the selected RocketWare files have been successfully installed on your startup drive. The Installer will also prompt you to restart your Macintosh.
7. Restore any virus-checking software you may have disabled.



8. Click on Restart. The Macintosh will restart, and the RocketWare files necessary to control Rocket will be loaded automatically.

Software installation is now complete. Store the RocketWare diskettes in a safe place in case they are needed for a future installation.

### ***Using the Help Button***

When you have launched the Installer application and the Easy Install window is on the screen, a **Help** button is available. Click on this button to display information about how to use the elements of the Installer.

**Help**



## Chapter 3

### Using the Radius Rocket

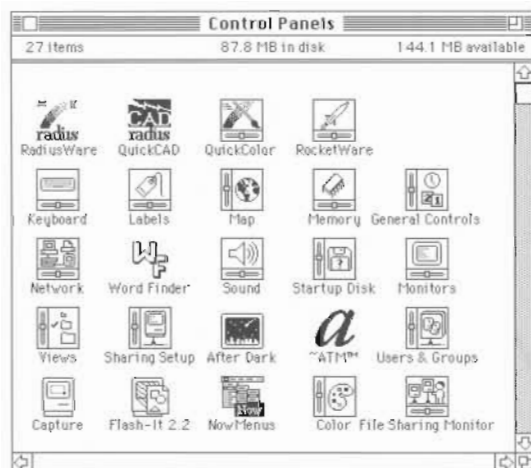
This chapter explains how to use the software that controls the operation of the Radius Rocket accelerator card. It is assumed that you have installed the Rocket hardware and software successfully, removed or disabled any other accelerator boards and software, and restarted your Macintosh.

#### **RocketWare Control Panel**

The RocketWare file is located in the Control Panels Folder.

*To access the RocketWare control panel,*

1. Choose Control Panels from the Apple menu. The Control Panels window will appear, similar to:



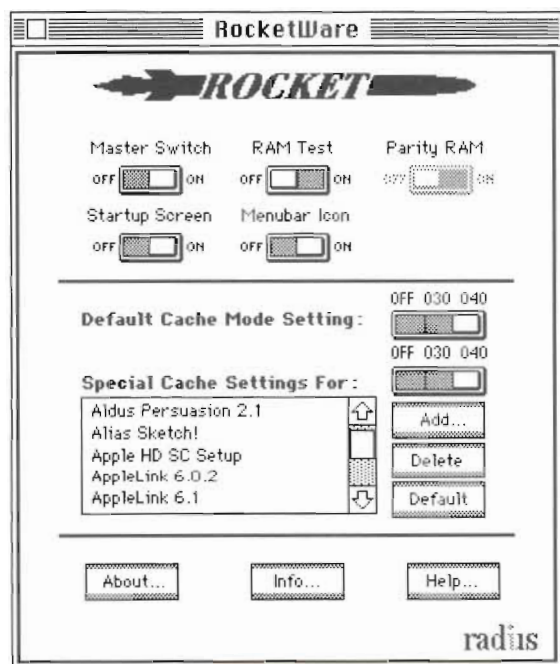
*The Control Panels window*



RocketWare

2. Double-click on the RocketWare icon to open the RocketWare control panel.

The RocketWare control panel serves as a master control for the operation of the Radius Rocket accelerator card. When you click on the RocketWare icon, the RocketWare control panel will appear, similar to the following diagram.



*The RocketWare control panel*

The following section explains the controls available in the RocketWare control panel.

### **Master Switch**

The Master Switch is used to activate or deactivate the Radius Rocket accelerator card. The white box of the switch indicates the current position of the switch. To change the position of



the Master Switch, click on either the OFF or ON side of the switch.

With the Master Switch turned on, the Rocket assumes control of the Macintosh and accelerates all applications and functions. Once the Master Switch has been set to the ON position, the Radius Rocket accelerator card will be activated every time the Macintosh is subsequently restarted. With the Master Switch turned off, the Radius Rocket accelerator card is disabled, and control is returned to the main Macintosh processor and memory.



Should you wish to temporarily prevent your Rocket from launching, hold down both the Command and "R" keys during startup.



**Important:** When you change the position of the Master Switch, you must restart the Macintosh for the change to take effect. Your Rocket will remain disabled until you restart your Macintosh.

RAM Test



### **RAM Test**

The RAM Test switch is used to activate a special test of the RAM installed in the Radius Rocket accelerator card. This test takes only a few seconds when the Macintosh is started. Radius recommends that this switch be left in the ON position. If the RAM Test switch is set to the OFF position, the RAM installed on Rocket will not be tested.



Rockets with more than 32MB of RAM may take 30 seconds or more to test all of its RAM. You may disable the RAM test to avoid the long test. Enable it to diagnose a suspected problem.



### Parity RAM

RAM parity is used primarily in government and military applications. As a method to ensure data integrity, an extra chip on each SIMM stores a parity bit for the other 8 bits.

The Parity RAM switch is used to accommodate the special parity RAM that may be installed in the Radius Rocket accelerator card.

The default setting for the Parity RAM switch is the OFF position. If RAM SIMM cards are installed in Rocket that contain no parity checking chip, this switch will be dimmed (unavailable).

With the Parity RAM switch set to the OFF position, Rocket assumes that *all* SIMM cards installed on Rocket will not use parity RAM. Likewise, with the Parity RAM switch set to the ON position, Rocket assumes that *all* SIMM cards installed on Rocket will use parity RAM.



**Important:** *If the Parity RAM switch is set to the ON position, the performance of the Radius Rocket accelerator card will always be slower than if the switch is in the OFF position.*

If you have installed parity SIMM cards in the Radius Rocket accelerator card, you may set this switch to either position: parity checking will only occur when the switch is set to the ON position.



### Startup Screen

The Startup Screen button controls the Rocket graphic that is displayed in the center of your screen when your Macintosh starts. You can prevent this screen from being displayed by clicking the Startup Screen button to OFF.

Menubar Icon  
OFF  ON

About...

Info...

Help...

### **Menu bar Icon**

The Menu bar Icon switch controls the small Rocket icon that appears on the right side of the menu bar when Rocket is activated. If this interferes with other icons or menu-bar clocks, you can make this icon disappear by clicking the Menu bar Icon button to OFF.

### **About... Button**

The About... button displays information about the software currently used to control the Radius Rocket accelerator card.

### **Info... Button**

The Info button shows a screen that provides configuration information about your Macintosh System, like Rocket speed, amount of memory and other key troubleshooting information.

### **Help... Button**

The Help button provides an explanation for each of the switches and buttons on the Rocket Control Panel.

## **Activating Rocket**

With the Rocket Control Panel on the screen, use the following procedure to activate the Radius Rocket card.

1. Make sure the Master Switch is set to the ON position.
2. Click on the RAM Test and Parity RAM switches to set them to the desired positions (as described in the previous section).
3. Close the Control panel to lock-in the settings.
4. Choose Restart from the Special menu.

In a moment, the Macintosh will restart, and the familiar "Welcome to Macintosh" screen will appear.

Next, information about your Macintosh will be loaded into the RAM of the Rocket card, and the screen display will go blank as the Macintosh starts a *second* time. *This is normal operation for the Radius Rocket accelerator card.*

Finally, the icons for any extension or control panel files installed in your System folder will appear across the bottom of the screen, and the normal Macintosh Finder will appear.



If you are using disk-protection or disk-locking software (*Empower* or *DiskLock*), you will have to enter your password *twice*: once when the Macintosh is first started, and a second time when Rocket is activated. This is normal operation for Rocket and is necessary whenever you first start the Macintosh or choose Restart from the Special menu in the Finder.



To confirm the amount of RAM available to Rocket, choose About This Macintosh from the Apple menu. The window that appears will now reflect the amount of memory installed in your Rocket, as shown in the following diagram.



*About This Macintosh window*

The Total Memory listed should reflect the amount of RAM installed on the Rocket card. The diagram above is typical of a Rocket card with 20 megabytes of RAM (bank A = 16MB, bank B = 4MB).





Rocket software overhead reserves approximately 1MB of RAM that does not appear in the About This Macintosh window. You should subtract 1MB from Total Memory to determine how much memory you actually have available on the Rocket.

### Cache Settings for Applications

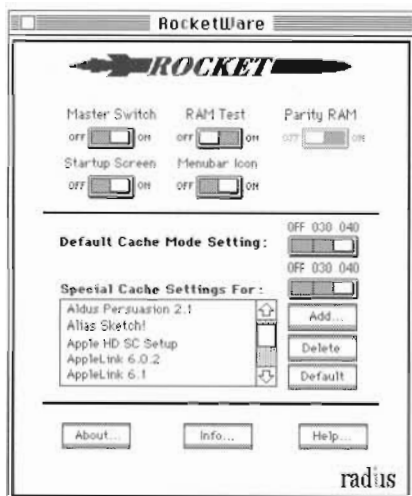
The RocketWare control panel is used to control the features of the Rocket card when used with specific software applications. Unless you specify otherwise, Rocket will use the default state as set by the Default Cache Mode switch.

To access the RocketWare Control Panel,

1. Choose Control Panels from the Apple menu.
2. Double-click on the RocketWare icon to activate the RocketWare control panel, which will appear as shown in the following diagram.



RocketWare



RocketWare control panel

OFF 030 040



OFF 030 040



Two switches are available in the middle of the panel to specify how the Rocket card interacts with a particular application. Both buttons have three mode settings. Cache OFF runs the application about the speed of the Mac IIx. Cache set to 030 is faster, but does not take full advantage of the 68040 cache scheme. Cache set to 040 is the fastest mode, and is comparable in speed to the Macintosh Quadra.

- **Default Cache Mode Setting** This switch determines the Cache Mode of all applications that do not appear in the list.
- **Special Cache Settings For:** This switch works for the highlighted application in the list. When an application is selected in the list, the switch setting determines the cache mode for that application only.

### **Changing Application Settings**

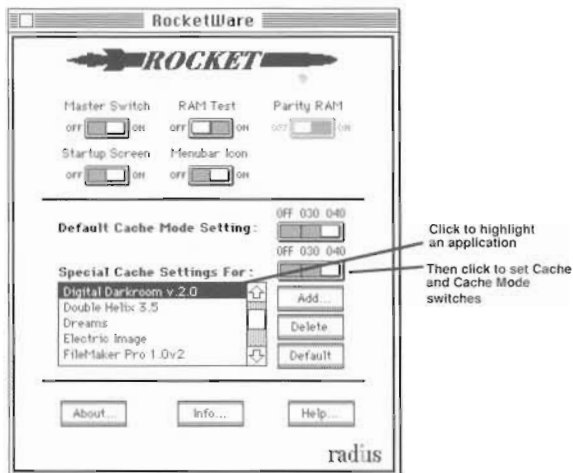
With the Rocket Control Panel on the screen, you can change the Cache and Cache Mode settings for any particular application.

Most software written before the Macintosh Quadra was introduced was created for the 68030 (or earlier) processor. Therefore, for these applications, the Cache Settings switch should be set to the 030 position. For newer software that is compatible with the 68040 processor, the 040 setting will result in a 10-20% performance improvement over the 030 setting.

If you are unsure whether a particular software application can be used with the 68040 Cache Setting, consult the user's manual supplied with the software or contact the technical support group of the software publisher. In general, if the version of the application you are using is compatible with the Macintosh Quadra, then the 68040 Cache Setting may be used.

To change the settings for an application,

1. Near the bottom of the panel is a scroll box with a list of applications that have been added. Scroll through this list and click to highlight the particular application you want to configure.



*Changing application settings*

2. Click on the Cache Mode switch to set as appropriate for the highlighted application.
3. Continue selecting applications from the scroll box and setting the switch as appropriate for each application.
4. When you are finished configuring applications, close the Control panel to lock-in the settings.



When the Control panel is closed, the changes to the settings for the various applications will take effect immediately; you do not have to restart the Macintosh to use the changes for the applications.

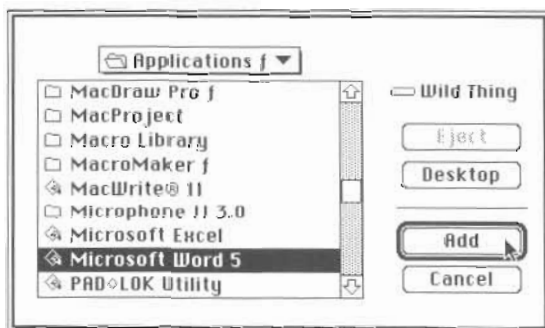
Add...

### **Adding Applications**

In addition to the applications listed in the scroll box of the Rocket Special Settings panel, you can add, and configure, any application on your Macintosh.

*To add an application to the scroll box of the Rocket Special Settings panel,*

1. Click on the Add button. A dialog box will appear, similar to the following diagram.



*Rocket Special Settings Add panel*

2. Locate the application you want to configure for the Rocket card and click on the Add button.
3. The dialog box will disappear, and the name of the application added alphabetically, and will be highlighted in the scroll box of the Rocket Special Settings panel.
4. With the name of the newly added application highlighted in the scroll box, set the Cache Setting switch as appropriate for the new application.

If you are unable to confirm the correct settings of the Cache switches for a particular application, experimentation is the key. Begin by setting the Cache Setting switch to the 030 position, and trying the new application. If the application performs well with this combination, return to the RocketWare

Control Panel and set the Cache Setting switch to the 040 position. Try your application again and compare results.

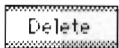
### **Deleting Applications**

Any of the applications listed in the scroll box of the Rocket Special Settings panel can be deleted. If an application is deleted from the scroll box, the default setting (as defined by the Default Cache Mode Setting switch) will be used when that application is run with the Rocket card. In other words, the Rocket will use the default settings for an undefined application.

Removing unused or unavailable applications from the application list will make it easier to change settings because you don't have to scroll through the whole list.

*To delete an application,*

1. Use the scroll box to locate the name of the application to be deleted and click on it to highlight it.
2. Click on the Delete button. The name of the application will be removed from the scroll box.

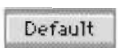


### **Using Application Defaults**

Rocket allows you to return to the default setting for any application listed in the scroll box of the RocketWare Control panel.

*To use the default for any application,*

1. Use the scroll box to locate the name of the application to be defaulted and click on it to highlight it.
2. Click on the Default button. Rocket restores the default setting of the application.



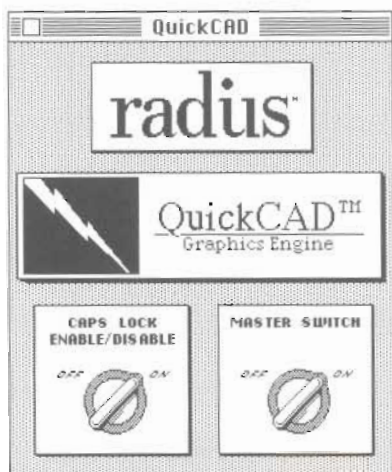


### Using QuickCAD

Radius QuickCAD functionality is built into your Rocket. QuickCAD accelerates display-list functions when used with software applications which are compatible with QuickCAD.

To activate QuickCAD,

1. Choose Control Panels from the Apple menu.
2. Double-click on the QuickCAD icon to activate the QuickCAD Control panel, which will appear similar to the following diagram.



*The QuickCAD control panel*



3. Click on the Master Switch to set QuickCAD to the ON position.
4. Close the Control panel to lock-in the setting.

CAPS LOCK  
ENABLE/DISABLE



### **Using the Caps Lock Enable/Disable Switch**

This feature allows you to compare the speed of Rocket's QuickCAD capabilities when QuickCAD is enabled (turned ON) or disabled (turned OFF).

*To work with the Caps Lock Enable/Disable switch,*

1. Choose the QuickCAD control panel as described in the previous section.
2. Click on the Caps Lock Enable/Disable Switch to set it to the ON position.
3. Close the control panel to lock-in the setting.
4. Launch your QuickCAD-compatible application. When the Caps Lock key on your keyboard is up, Rocket's QuickCAD acceleration will be activated. When the Caps Lock key on your keyboard is pushed down, QuickCAD acceleration will be disabled.

### **Using QuickColor**

Radius QuickColor functionality is built into Rocket. QuickColor accelerates Apple's QuickDraw functions for all Macintosh applications.

QuickColor should be installed if you have a video card that is capable of delivering more than a 1-bit signal (8-bit gray scale). QuickColor will accelerate QuickDraw in an 8, 16, or 24-bit mode. If your video card is a monochrome-only card, there is no benefit of installing QuickColor.





- Click on the radio button to select the operating state you want, as shown in the diagram below. Choices exist for QuickColor always being active, always inactive, or only active when the Caps Lock key is up.



*QuickColor control panel*

- The accelerators and interfaces that work with QuickColor will become highlighted and checked on the QuickColor control panel.



## Chapter 4

### About the Radius Rocket

This chapter describes how the Radius Rocket works with the Macintosh II family of computers. You should read this chapter to understand how the Radius Rocket relates to the existing circuitry of your Macintosh II, and how the acceleration provided may influence the applications you use.

#### Macintosh Processors

All Macintosh computers, dating back to the original Macintosh introduced in 1984, are based on the Motorola 68000 family of processor chips. Currently, there are five versions of this Motorola processor. They are:

- **68000** This processor was incorporated in the original Macintosh back in 1984 and has since been updated for higher clock (processing) speeds. It is still used in the Macintosh Classic and Macintosh PowerBook 100.
- **68020** This processor first appeared in the original Macintosh II and is currently used in the Macintosh LC. The performance of mathematics calculations executed by the 68020 can be enhanced by the addition of a math coprocessor chip: the Motorola 68881/68882 chip. This coprocessor chip was included on the main logic board of the original Macintosh II. It does not appear on the Macintosh LC.
- **68030** This processor first appeared on the Macintosh IIfx and is currently used in the Macintosh IIfx, IIfx, IIfx, and the IIfx. As with the 68020, the performance of mathematics calculations is enhanced with the addition of a separate coprocessor chip. The 68030 processor is a

combination of the 68020 processor that appeared in the original Macintosh II and another Motorola chip: the 68851 PMMU (Paged Memory Management Unit) chip. The PMMU portion of the chip enables it to access additional (virtual) memory, such as might be stored on a hard disk drive.

- **68040** This processor is the latest incarnation of the Motorola 68000 family and represents a combination of *three* separate chips: the main processor, the math coprocessor, and the PMMU chip. Used in the Quadra computers, the 68040 incorporates sophisticated memory cache features, which further speed the processing of frequently-used operations.
- **68LC040** This processor powers the Rocket 25i. It contains no floating-point math functions, but otherwise, is identical to the 68040.

Although the above descriptions of the various Motorola processor chips are simplifications, the important point is that the 68040 processor chip incorporated in the Radius Rocket accelerator card represents a combination of integrated processor chips. This integration of features *in the same processor*, in conjunction with larger, improved memory caches and RISC instruction-optimization methods, contributes to the 68040's dramatic performance increase over earlier Motorola processors.

### **Processor Performance**

Processor performance is rated in two ways. The first is the sheer speed of the processor, rated in how many instructions can be processed in a single second. For the advanced processors used in the Macintosh II family, this is rated in MIPs (Millions of Instructions Per second).

The second rating indicates how many floating-point operations can be processed in a single second. This is rated in MFLOPS (millions of floating-point operations per second).

The following table illustrates the relative levels of maximum performance for Rocket, compared to standard (unaccelerated) Macintosh computers.

|             | Rocket 25i | Rocket 33 | Mac IIx | Mac IIfx | Mac II |
|-------------|------------|-----------|---------|----------|--------|
| MIPs (peak) | 22         | 29        | 10      | 6.1      | 2.6    |
| MFlops      | n/a *      | 4.6       | 0.75    | 0.46     | 0.3    |

\* the Rocket 25i has no floating-point math coprocessor and thus no MFlops rating

As described in the previous section, processor speed is just one component of the performance equation. The table above shows that the MIPs rating of Rocket makes it about three times as fast as a Macintosh IIx. However, the *integration* of features incorporated in the 68040 processor, with advanced memory and NuBus interface circuitry, results in even more startling performance improvements:

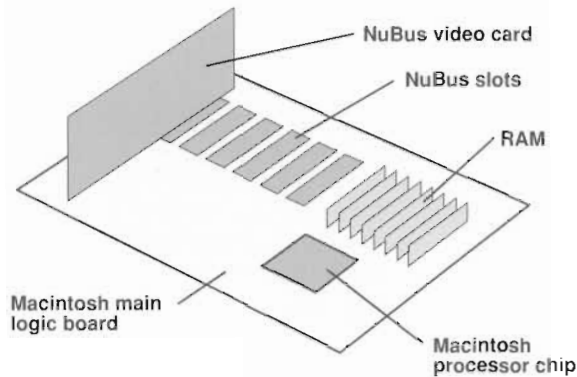
- Up to *four times* the speed of a Macintosh IIx for QuickDraw graphics-intensive operations, such as scrolling and zooming.
- Up to *five times* the speed of a Macintosh IIx for floating point mathematics operations.

The use of the advanced Motorola 68040 processor in the Radius Rocket accelerator card clearly represents a breakthrough in Macintosh system performance.

### **The Data Path**

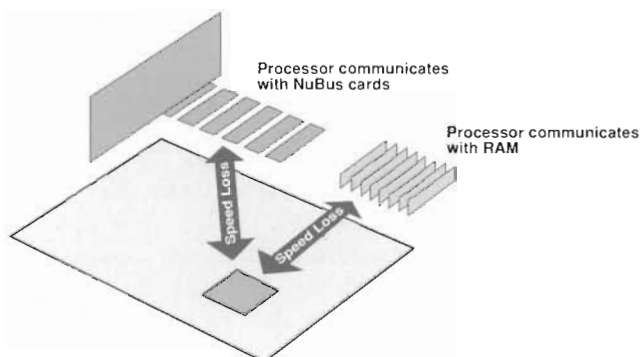
Another performance consideration is how effectively the processor communicates with the other components of a Macintosh. For example, the processor must read and write data to the RAM used by the system. In addition, high-performance Macintosh systems use a separate NuBus interface card to control the display connected to the Macintosh.

The following diagram illustrates the major components of the Macintosh II, as they are laid out on the main logic board.



#### *Data components of the Macintosh*

To visualize how data is transferred within a Macintosh, imagine that the processor on the main logic board, the RAM, and the NuBus cards are on three separate platforms — which they are, as far as the processor is concerned. The following diagram illustrates how the processor sends data to, and receives data from, these other platforms.

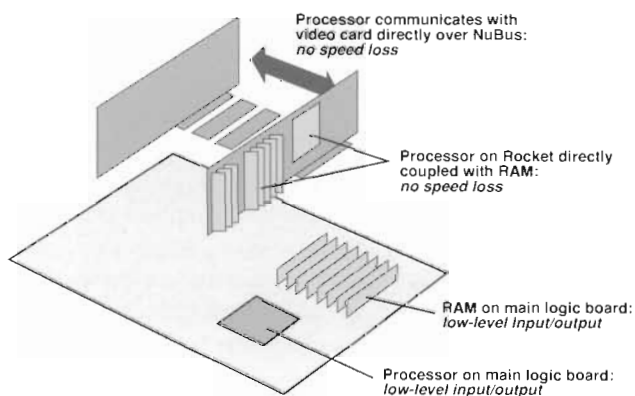


*Expanded view of the data components*



There is a speed loss as the processor communicates with either the NuBus display card or the RAM. This inhibits the overall system performance — regardless of the processor speed.

The Radius Rocket overcomes this speed loss by moving the processor and the RAM onto a NuBus card, as shown below.



*Data components with Radius Rocket installed*

Note that the processor and RAM on the main logic board are still active to perform low level input/output operations, such

as keyboard entries and mouse movement. This frees the Rocket's 68040 processor to concentrate on time-critical processing operations, which further increases system performance.

As shown in the diagram above, the processor is tightly coupled to the RAM used by the system. To further enhance performance, Rocket uses special interleaving between its banks of memory — dramatically reducing the time it takes for the processor to access RAM.

There is another advantage to placing the processor on the Macintosh's NuBus: block transfer. Block transfer describes a way that data is transferred between NuBus cards. With block transfer, data is quickly and efficiently transmitted in large groups.

If the NuBus interface cards installed in the Macintosh support block transfer, the Radius Rocket can use this technique to further boost performance. Note that Radius interface cards make use of block transfer to communicate image data over NuBus — making the Radius Rocket extremely fast when used in conjunction with other Radius products.

### **System Compatibility**

The Motorola 68040 processor used in the Radius Rocket represents the *future* development platform for the Macintosh. As the Macintosh evolves, Apple will continue to use this processor in new versions of the computer. Installing the Radius Rocket accelerator card represents a step toward future Macintosh compatibility.

At the present, it is important to note that installation of the Radius Rocket accelerator card leaves the processor and RAM on the Macintosh completely intact. If it ever becomes necessary to use software that is incompatible with Rocket, the solution is as simple as accessing the Macintosh Control

Panels, double-clicking on the Rocket icon, turning off the Rocket from its own control panels, and restarting the Macintosh. In other words, Rocket is installed *in addition to* the Macintosh's processor and RAM, unlike some acceleration products that *replace* the Macintosh's processor.





## Chapter 5

### Reference

This chapter contains troubleshooting tips and information about Radius Customer Support and Service.

#### Troubleshooting

Should you experience a problem with your Radius Rocket accelerator card, first take a few minutes to try to isolate the difficulty. Performing a few basic steps will help you determine whether there is, in fact, a problem.

*If the Radius Rocket does not seem to work,*

- Make sure that the Rocket card is properly seated in a NuBus slot.
- Make sure that both the Rocket and Rocket Cargo files are installed in the System folder of your *startup drive*. When the Macintosh is started, the startup drive's icon appears at the upper right-hand corner of the Finder.

*If the Macintosh starts and then immediately shuts down (power off),*

- The NuBus cards installed in your Macintosh consume more power than the power supply can provide. Remove unused NuBus cards that may overload the Macintosh power supply.

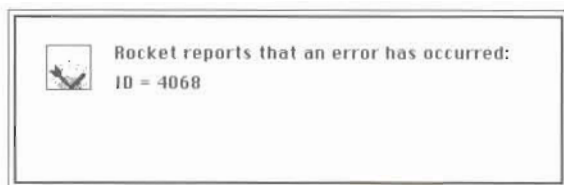
*If the Macintosh starts, restarts with Rocket, begins loading INIT files, and then freezes (the Finder never appears),*

- Some System extension or control panel files installed in the System folder of your startup drive may not be compatible with Rocket. Begin by removing *all* System

extension or unneeded control panel files from your System folder that are not related to Rocket, and restarting your Macintosh.

If Rocket performs normally at this point, reinstall system INIT files, one at a time, and restart the Macintosh. This procedure will enable you to determine the particular INIT file which is incompatible with Rocket.

*If the Macintosh displays an error dialog box as shown in the following diagram.*



*A Rocket error dialog box*

- Rocket has detected an error on startup. When this dialog box appears, an ID number will identify the nature of the problem detected by Rocket. For some of the error ID numbers, a brief description of the problem will also appear in the dialog box. The following section lists most of the error ID numbers which may appear in the Rocket Error dialog box. For further information, contact your Radius Authorized Reseller or Radius Customer Service at (408) 434-1012.

**ID = 4068** Rocket has detected a problem with one (or more) of the RAM SIMM cards installed in Rocket's memory Bank 1. The SIMM card may not be installed properly, or it may be defective. Remove the Rocket card and ensure that all of the SIMM cards are firmly snapped into position as described in the *Installing the SIMM Cards* section, which appears in Chapter 1. If the error recurs, replace the RAM SIMM cards.

**ID = 4069** Rocket has detected a problem with one (or more) of the RAM SIMM cards installed in Rocket's memory Bank 2. The SIMM card may not be installed properly, or it may be defective. Remove the Rocket card and ensure that all of the SIMM cards are firmly snapped into position as described in the *Installing the SIMM Cards* section, which appears in Chapter 1. If the error recurs, replace the RAM SIMM cards.

**ID = 4097** Rocket encountered a problem when automatically launching one (or more) of the RocketWare files. In this case, reinstall the RocketWare files as described in the *Installing RocketWare* section, which appears in Chapter 2.

**ID = 4100** Rocket detected a problem with the ROM on the Macintosh's main logic board. You should have your Macintosh checked by an Authorized Apple Service Provider.

**ID = 4101** Rocket has determined that an incompatible version of the System File is installed on your startup drive (e.g., System 6.0.7). Rocket requires that System 7.0.1 be installed in the System folder of your startup drive. Update your system software.

**ID = 4102** Rocket has been installed in an incompatible Macintosh computer, such as the Macintosh IIsx or Macintosh LC.

**ID = 4103** Rocket has detected a virtual memory error. Such an error would be generated if you have installed special virtual memory software that is incompatible with Rocket.

**ID = 4104** Rocket has determined that there is insufficient RAM installed on the main logic board of your Macintosh. At least 4MB of RAM must be installed. The problem could also be that one (or more) of the RAM

SIMM cards installed on the main logic board of the Macintosh may be defective. Add to or replace RAM cards as appropriate.

**ID = 4610** Rocket has detected a bad memory configuration. In other words, one (or more) of the RAM SIMM cards is not compatible with Rocket — most likely, they are the old-style 256K SIMMs. Chapter 1 describes the types of RAM SIMM cards which are compatible with Rocket. Add to or replace RAM cards as appropriate.

**ID = 4611** Rocket has detected a problem within its own circuitry. In this case, remove Rocket and return it to your Radius Authorized Reseller for repair.

**ID = 4612** Rocket has detected a parity error with one (or more) of the special parity RAM SIMM cards installed in either of Rocket's memory banks. Refer to Chapter 3 regarding Parity RAM and see if you have the Rocket controls set properly. Replace your SIMMs if needed.

**ID = 4613** Rocket has encountered an unexpected error. This error could have been generated by a problem with one (or more) of the NuBus cards installed in your Macintosh, by a problem with the processor on the Macintosh's main logic board, or by some other hardware problem which Rocket couldn't anticipate. Begin by eliminating other NuBus cards one at a time and restarting your Macintosh.

**ID = 4614** Rocket encountered a RAM-test timeout. It could not confirm the integrity of its SIMM cards within a certain amount of time. In this case, turn off the RAM test feature in the RocketWare Control Panel. If the problem persists, replace your SIMMs.

*If Rocket is installed in an early Macintosh II and does not function properly,*

- Rocket is not compatible with Macintosh II logic boards with revision A ROMs.

*If an application does not work properly with Rocket, but works properly with Rocket turned off,*

- Check the cache settings in the Rocket Special Settings panel. You may need to add the application to the Special Settings list as described in Chapter 3: *Using the Radius Rocket*.
- The application may violate Apple's guidelines by making processor-specific programming calls. This is particularly true of early Macintosh games. In this case, Rocket must be turned off for the application to operate correctly.

*If Rocket is used in conjunction with a video interface card that was not manufactured by Radius or Apple Computer, Inc. and does not work properly,*

- There is a problem with the video interface card, which makes it incompatible with Rocket. In this case, contact the manufacturer of the video interface card and explain that you are using it in conjunction with the Radius Rocket accelerator card. Ask if their card is compatible with NuBus-master cards, such as the Radius Rocket. There may be a ROM upgrade or software upgrade that will solve the problem.

If you are having a problem that you think may be related to the Radius Rocket accelerator card, contact your Radius Authorized Reseller for assistance.

### About the Power Supply

The Macintosh power supply provides power to the main motherboard, the memory installed on the motherboard, internal disk drives and storage devices, and any NuBus cards that are installed in the Macintosh. The following chart shows the capacities (in watts) for the Macintosh II family. The total capacity at +5 volts (in amps) is the type of current of primary importance for components installed in your system, and the +5 volt current budgeted for these components.

| Macintosh Model                                  | IIcx, IIci | II, IIx, IIfx |
|--------------------------------------------------|------------|---------------|
| Number of slots                                  | 3          | 6             |
| Power supply capacity (watts)                    | 90.0       | 132.0         |
| Power supply +5V capacity (amps)                 | 12.0       | 18.0          |
| Power (+5V) budgeted for NuBus slots (amps)      | 6.0        | 12.0          |
| Power (+5V) budgeted per slots                   | 2.0        | 2.0           |
| Power (+5V) budgeted for disks, RAM, etc. (amps) | 6.0        | 6.0           |

The following chart details the amperes (amps) requirement for each Rocket model with various amounts of RAM installed.

| Rocket equipped with:            | Rocket 25i | Rocket 33 |
|----------------------------------|------------|-----------|
| 8 x 1 MB SIMMs<br>(8MB total)    | 2.5        | 3.0       |
| 4 x 4 MB SIMMs<br>(16MB total)   | 2.1        | 2.6       |
| 8 x 4 MB SIMMs<br>(32MB total)   | 2.5        | 3.0       |
| 16 x 4 MB SIMMs<br>(64MB total)  | 3.3        | 3.8       |
| 16 x 8 MB SIMMs<br>(128MB total) | 4.9        | 5.4       |

Note that composite 16MB memory modules (16MB SIMM modules, populated with 4MB chips) will draw an additional 1 to 2 amps (total, for each Rocket) compared to Rockets equipped with 4MB memory modules.

## ***Radius Customer Support and Service***

Radius has created a worldwide authorized reseller network to provide extensive support in both sales and service. If you cannot return your equipment to the Reseller from whom you purchased your Radius system, or do not know the location of the nearest Radius Authorized Reseller, please contact the Radius information center at (800) 227-2795. For Reseller information outside the United States, contact the local Radius International Distributor or write to:

### **Radius Inc**

International Sales Department

1710 Fortune Drive

San Jose, California 95131-1744 USA

(408) 434-1010

If you have a problem, need answers to technical questions, or need information about product updates, you should contact your Radius Authorized Reseller for assistance. If you have a problem, be sure to that you have reviewed the trouble-shooting section of this manual, and have written out the following information prior to your call. This will expedite the diagnosis and correction of your problem.

- Radius product (s)
- Macintosh model and general configuration (hard drives and other peripherals)
- Version numbers of the following files:
  - RadiusWare
  - Soft Pivot
  - Radius Resolutions
  - Dynamic Desktop
  - System
  - Finder



If, after consulting with your Radius Authorized Reseller, you need further assistance, contact Radius Customer Support through any of the following:

| Service        | Address            | Forum Address         |
|----------------|--------------------|-----------------------|
| AppleLink      | RADIUS.Tech        | Third Parties:Radius  |
| America Online | RadiusTS           | Keyword: RADIUS       |
| CompuServe     | 76004,2155         | GO APVENB, Library 14 |
| Internet       | support@radius.com |                       |

Radius also maintains a multi-line BBS that contains the most-current software releases and other current information. This is available at (408) 954-1689, from 1200 to 9600 baud (V.32, V.42bis). Your terminal program must be able to emulate either VT100, VT52, or ANSI. Set your modem for no parity, 8 stop bits, 1 stop bit.

Telephone voice support is available at (408) 434-1012, Monday through Friday, 6:00 AM to 6:00 PM, Pacific Standard Time.

Radius Customer Service can also be reached via facsimile at (408) 954-1015.

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### ***Radius International Sales Offices***

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250 The Esplanade  
Suite 110  
Toronto, Ontario, M5A 1J2

telephone: (416) 777-9900

fax: (416) 777-9911

#### **Radius France**

BP422, Bureau 300  
World Trade Center 2  
CNIT, 2 place de la Défense  
92053 Paris-la-Défense

telephone: 1 4692-2335

fax: 1 4692-2337

#### **Radius GmbH (European Hq)**

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Germany

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fax: (49) 69 950822-88

#### **Radius K. K. (Japan)**

Yanaba Bldg 5F  
6-7-10 Roppongi, Minato-ku  
Tokyo

telephone: 3-5410-2480

fax: 3-5410-1624

#### **Radius United Kingdom**

Mill Court, Mill Lane  
Newbury, Berkshire, RG145RE

telephone: 635-38531

fax: 635-41286

### ***The Radius FAX Information System***

If you wish to take advantage of an immediate response system for Radius products and domestic-suggested retail price lists, you may call one of the following numbers 24 hours a day, and by following the instructions, you will receive the information you want by return-facsimile transmission.

- United States and Canada (800) 966-7360
- Outside U.S. & Canada (408) 954-6670

## Appendixes

### Appendix A: Technical Specifications

- **System Bus:** NuBus
- **Power:**

|                    |               |
|--------------------|---------------|
| with 8MB RAM, @ 5V |               |
| <b>25 MHz</b>      | <b>33 MHz</b> |
| 2.5 amps           | 3.0 amps      |
- **Processor:** Motorola 68040 or 68LC040
  - Instruction Caches:** 4KB four-set associative  
4KB instruction data cache
  - Clock Speed:** **25 MHz** | **33 MHz**
  - Performance:** 22 MIPS, @ 25MHz | 29 MIPS, @ 33MHz  
3.6 MFLOPS | 4.6 MFLOPS
  - Internal ALU clock:** 50 MHz | 66 MHz
- **Memory Bandwidth:**

|                       |                                 |
|-----------------------|---------------------------------|
| with interleaving:    | 50MB/sec reads; 36MB/sec writes |
| without interleaving: | 36MB/sec reads; 36MB/sec writes |
- **DRAM Support:** up to 128MB, 100ns or faster  
parity or non-parity
- **NuBus Bandwidth:** with Blk Transfer, up to 20MB/sec
- **Built-in Acceleration:**
  - 32-Bit QuickDraw graphics acceleration
  - QuickCAD display-list processing acceleration

## **Appendix B: Regulatory Approvals**

**RFI: FCC Class B, Canadian DOC Class B, Japanese VCCI Class 2, Written EN 55022**

### **FCC Statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- In case of TV or radio interference, turn the antenna until the interference stops, or consider installing an antenna with coaxial cable lead-in between the antenna and the TV.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications or changes to this product that are not expressly approved by Radius could void the user's authority to operate the equipment.

To insure compliance to FCC non-interference regulations, peripherals attached to this computer require shielded I/O cables.

You may find the following booklet prepared by the Federal Communications Commission helpful:

*How to Identify and Resolve Radio-TV Interference Problems*

This booklet is available from:  
U.S. Government Printing Office  
Washington, DC 20402  
Stock # 004-000-00345-4

### **Canadian RFI Statement**

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

### **Japanese VCCI Statement**

This equipment is in the 2nd Class category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential area.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling.

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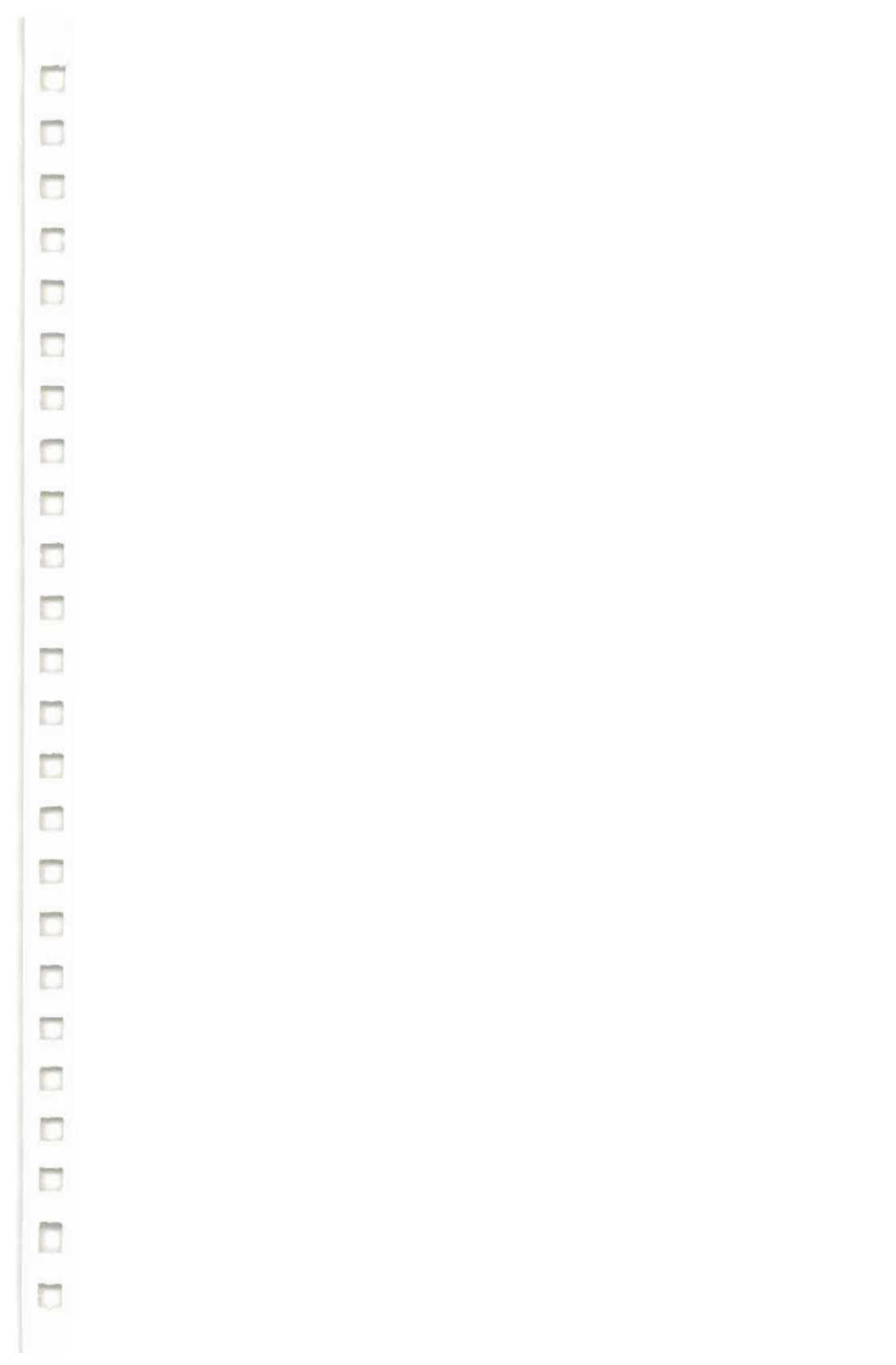
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